# 2022 NIAC SYMPOSIUM AGENDA

**September 20-22, 2022**

**All Times Are Mountain Standard Time**

## DAY 1: Tuesday, September 20

| Time (MST) | Event | Speaker |
|---|---|---|
| 9:00 AM | **Special Address** | **Pamela Melroy, NASA Deputy Administrator** |
| 9:10 AM | **Welcome** | **Liesl Folks, University of Arizona<br>Senior VP of Academic Affairs, Provost** |
| 9:20 AM | **Welcome & Overview** | *Michael LaPointe, NIAC Program Executive* |
| 9:30 AM | **Keynote Address** | **Steve Jurczyk, Co-Founder, President, and CEO, Quantum Space<br>Former NASA Associate and Acting Administrator** |
| 10:30 AM | **BREAK & Planetary Radio Interviews with Mat Kaplan** | |
| 10:50 AM | *2022 Phase I* | *Darmindra Arumugam, NASA JPL, Cryospheric Rydberg Radar* |
| 11:10 AM | *2022 Phase I* | *Steven Barrett, MIT, Silent, Solid-State Propulsion for Advanced Air Mobility Vehicles* |
| 11:30 AM | *2022 Phase I* | *Jason Benkoski, Los Alamos National Lab, Combined Heat Shield and Solar Thermal Propulsion System for an Oberth Maneuver* |
| 11:50 AM | *2022 Phase I* | *Elena D'Onghia, Univ. Wisconsin, Madison, CREW HaT: Cosmic Radiation Extended Warding using the Halbach Torus* |
| 12:10 PM | **LUNCH & Planetary Radio Interviews with Mat Kaplan** | |
| 1:30 PM | *2021 Phase II* | *Saptarshi Bandyopadhyay, NASA JPL, Lunar Crater Radio Telescope (LCRT) on the Far-Side of the Moon* |
| 1:50 PM | *2021 Phase II* | *Lynn Rothschild, NASA ARC, Mycotecture Off Planet* |
| 2:10 PM | *2021 Phase II* | *Kerry Nock, Global Aerospace Corporation, Pluto Hop, Skip, and Jump* |
| 2:30 PM | **BREAK & Planetary Radio Interviews with Mat Kaplan** | |
| 2:50 PM | *2022 Phase II* | *Marco Pavone, Stanford University, ReachBot: Small Robot for Large Mobile Manipulation Tasks in Martian Cave Environments* |
| 3:10 PM | *2022 Phase II* | *Zac Manchester, Carnegie Mellon University, Kilometer-Scale Space Structures from a Single Launch* |
| 3:30 PM | ***Poster Session Group A*** | |
| 4:30 PM | **ADJOURN** | |
| 5:00 PM | **Informal NIAC Fellows' Meet & Greet Event** | |

# 2022 NIAC SYMPOSIUM AGENDA

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## DAY 2: Wednesday, September 21

| Time (MST) | Event | Speaker |
|---|---|---|
| 9:00 AM | **Welcome & NIAC Plans** | *NIAC Staff* |
| 9:30 AM | **Keynote Address** | **Erika Hamden, University of Arizona Assistant Professor, Dept. of Astronomy; Assistant Astronomer, Steward Observatory** |
| 10:30 AM | **BREAK & Planetary Radio Interviews with Mat Kaplan** | |
| 10:50 AM | *2022 Phase I* | *Bonnie Dunbar, Texas A&M, The Spacesuit Digital Thread: 4.0 Manufacture of Custom High Performance Spacesuits for the Exploration of Mars* |
| 11:10 AM | *2022 Phase I* | *Ivan Ermanoski, Arizona State Univ., Breathing Mars Air: Stationary and Portable O2 Generation* |
| 11:30 AM | *2022 Phase I* | *Sara Seager, MIT, Venus Atmosphere and Cloud Particle Sample Return for Astrobiology* |
| 11:50 AM | *2022 Phase I* | *John Mather, NASA GSFC, Hybrid Observatory for Earth-like Exoplanets (HOEE)* |
| 12:10 AM | **LUNCH & Planetary Radio Interviews with Mat Kaplan** | |
| 1:30 PM | *2021 Phase II* | *Artur Davoyan, UCLA, Extreme Solar Sailing for Breakthrough Space Exploration* |
| 1:50 PM | *2021 Phase II* | *Joel Sercel, TransAstronautica Corp., Sutter Ultra: Breakthrough Space Telescope for Prospecting Asteroids* |
| 2:10 PM | *2021 Phase II* | *Jeffrey Balcerski, Ohio Aerospace Institute, Lofted Environmental Venus Sensors (LEAVES)* |
| 2:30 PM | **BREAK & Planetary Radio Interviews with Mat Kaplan** | |
| 2:50 PM | *2022 Phase II* | *Javid Bayandor, State Univ. of New York, Buffalo, BREEZE-Bioinspired Ray for Extreme Environments and Zonal Exploration* |
| 3:10 PM | *2022 Phase II* | *E Nemanick, The Aerospace Corporation, Atomic Planar Power for Lightweight Exploration (APPLE)* |
| 3:30 PM | ***Poster Session Group B*** | |
| 4:30 PM | **ADJOURN** | |
| 5:30 PM | **Free Evening for Fellows' Networking and Collaboration + Women of Science Event** | |

# 2022 NIAC SYMPOSIUM AGENDA

**September 20-22, 2022**

**All Times Are Mountain Standard Time**

## DAY 3: Thursday, September 22

| Time (MST) | Event | Speaker |
|---|---|---|
| 9:00 AM | **NIAC Q&A** | *NIAC Staff* |
| 9:30 AM | **Keynote Address** | ***John Adams, Deputy Director, Chief Operating Officer, Biosphere 2, The University of Arizona*** |
| 10:30 AM | **BREAK & Planetary Radio Interviews with Mat Kaplan** | |
| 10:50 AM | *2022 Phase I* | *Mahmooda Sultana, NASA GSFC, SCOPE: Science Craft for Outer Planet Exploration* |
| 11:10 AM | *2022 Phase I* | *Marcin Pilinski, UC Boulder, In-situ Neutral-Optics Velocity Analyzer for Thermospheric Exploration (INOVATE)* |
| 11:30 AM | *2022 Phase I* | *Jonathan Sauder, NASA JPL, Starburst: A Revolutionary Under-Constrained Adaptable Deployable Structure Architecture* |
| 11:50 AM | *2022 Phase I* | *Philip Lubin, UCSB, Pi – Terminal Defense for Humanity* |
| 12:10 PM | **LUNCH & Planetary Radio Interviews with Mat Kaplan** | |
| 1:30 PM | *2022 Phase II* | *Ethan Schaler, NASA JPL, SWIM- Sensing with Independent Micro-swimmers* |
| 1:50 PM | *2022 Phase III* | *Amber Dubill, JHU/APL, Diffractive Solar Sailing* |
| 2:10 PM | *2021 Phase III* | *Nickolas Solomey, Wichita State University, Cube-Sat Space Flight Test of a Neutrino Detector* |
| 2:30 PM | **ADJOURN** | |
| **FRIDAY TOURS** | **Local tours available for Fellows (TBD)** | |

# 2022 NIAC SYMPOSIUM AGENDA

**September 20-22, 2022**

## POSTER SESSION SCHEDULE - GROUP A - Tuesday, September 20, 2022

| | |
|---|---|
| ***2022 Phase I Fellows*** | |
| *Darmindra Arumugam* | *Cryospheric Rydberg Radar* |
| *Steven Barrett* | *Silent, Solid-State Propulsion for Advanced Air Mobility Vehicles* |
| *Jason Benkoski* | *Combined Heat Shield and Solar Thermal Propulsion System for an Oberth Maneuver* |
| *Elena D'Onghia* | *CREW HaT: Cosmic Radiation Extended Warding using the Halbach Torus* |
| *Bonnie Dunbar* | *The Spacesuit Digital Thread: 4.0 Manufacture of Custom High Performance Spacesuits for the Exploration of Mars* |
| *Ivan Ermanoski* | *Breathing Mars Air: Stationary and Portable O2 Generation* |
| ***2021 Phase II Fellows*** | |
| *Saptarshi Bandyopadhyay* | *Lunar Crater Radio Telescope (LCRT) on the Far-Side of the Moon* |
| *Lynn Rothschild* | *Mycotecture Off Planet* |
| *Kerry Nock* | *Pluto Hop, Skip, and Jump* |
| ***2022 Phase II Fellows*** | |
| Zac Manchester | *Kilometer-Scale Space Structures from a Single Launch* |
| Marco Pavone | ReachBot: Small Robot for Large Mobile Manipulation Tasks in Martian Cave Environments |
| ***2022 Phase III Fellow*** | |
| Amber Dubill | *Diffractive Solar Sailing* |

# 2022 NIAC SYMPOSIUM AGENDA

**September 20-22, 2022**

**POSTER SESSION SCHEDULE – GROUP B - Wednesday, September 21, 2022**

| | |
|---|---|
| ***2022 Phase I Fellows*** | |
| *Philip Lubin* | *Pi – Terminal Defense for Humanity* |
| *John Mather* | *Hybrid Observatory for Earth-like Exoplanets (HOEE)* |
| *Mahmooda Sultana* | *SCOPE: Science Craft for Outer Planet Exploration* |
| *Marcin Pilinski* | *In-situ Neutral-Optics Velocity Analyzer for Thermospheric Exploration (INOVATE)* |
| *Jonathan Sauder* | *Starburst: A Revolutionary Under-Constrained Adaptable Deployable Structure Architecture* |
| *Sara Seager* | *Venus Atmosphere and Cloud Particle Sample Return for Astrobiology* |
| ***2021 Phase II Fellows*** | |
| *Joel Sercel* | *Sutter Ultra: Breakthrough Space Telescope for Prospecting Asteroids* |
| *Jeffrey Balcerski* | *Lofted Environmental Venus Sensors (LEAVES)* |
| *Artur Davoyan* | *Extreme Solar Sailing for Breakthrough Space Exploration* |
| ***2022 Phase II Fellows*** | |
| *Ethan Schaler* | *SWIM- Sensing with Independent Micro-swimmers* |
| E Nemanick | Atomic Planar Power for Lightweight Exploration (APPLE) |
| Javid Bayandor | *BREEZE- Bioinspired Ray for Extreme Environments and Zonal Exploration* |
| ***2021 Phase III Fellow*** | |
| Nickolas Solomey | *Cube-Sat Space Flight Test of a Neutrino Detector* |

**KEYNOTE SPEAKERS**

**DAY 1, Tuesday, September 20**

**Pamela Melroy**
**NASA Deputy Administrator, Col. (USAF, ret)**

As Deputy Administrator, Melroy performs the duties and exercises the powers delegated by the Administrator, assists the Administrator in making final agency decisions, and acts for the Administrator in his absence by performing all necessary functions to govern NASA operations. Melroy is also responsible for laying the agency's vision and representing NASA to the Executive Office of the President, Congress, heads of federal and other appropriate government agencies, international organizations, and external organizations and communities.

Melroy was commissioned through the Air Force Reserve Officers' Training Corps (ROTC) program in 1983. As a co-pilot, aircraft commander, instructor pilot, and test pilot, Melroy logged more than 6,000 flight hours in more than 50 different aircraft before retiring from the Air Force in 2007. She is a veteran of Operation Desert Shield/Desert Storm and Operation Just Cause, with more than 200 combat and combat support hours.

Melroy was selected as an astronaut candidate by NASA in December 1994. Initially assigned to astronaut support duties for launch and landing, she also worked advanced projects for the Astronaut Office. She also performed Capsule Communicator (CAPCOM) duties in mission control. In addition, she served on the Columbia Reconstruction Team as the lead for the crew module and served as Deputy Project Manager for the Columbia Crew Survival Investigation Team. In her final position, she served as Branch Chief for the Orion branch of the Astronaut Office.

One of only two women to command a space shuttle, Melroy logged more than 38 days (924 hours) in space. She served as pilot on two flights, STS-92 in 2000 and STS-112 in 2002, and was the mission commander on STS-120 in 2007. All three of her missions were assembly missions to build the International Space Station.

After serving more than two decades in the Air Force and as a NASA astronaut, Melroy took on a number of leadership roles, including at Lockheed Martin, the Federal Aviation Administration, the Defense Advanced Research Projects Agency, Nova Systems Pty, Australia, and as an advisor to the Australian Space Agency. She also served as an independent consultant and a member of the National Space Council's Users Advisory Group.

Melroy holds a bachelor's degree in physics and astronomy from Wellesley College and a master's degree in Earth and Planetary Sciences from the Massachusetts Institute of Technology.

**Liesl Folks**
**Senior Vice President for Academic Affairs and Provost**
**Professor, Electrical & Computer Engineering**

Dr. Liesl Folks is the Senior Vice President and Provost at the University of Arizona. She is the chief academic officer of the university and oversees all academic programs and units exclusive of the health sciences. She is responsible for all affairs related to the academic mission of the University including the faculty, academic programs, and related budgeting. As a member of the President's senior leadership team, her role includes the implementation of the strategic plan for the institution, and ensuring that the University demonstrates excellence as it pursues its missions of delivering an outstanding education that prepares students for the 4th Industrial Revolution, conducting research and discovery that addresses society's grand challenges, defining what it means to be a global university, living and breathing the university's core values to enable institutional excellence, as well as advancing the land grant mission in the State of Arizona. As the chief academic officer, Dr. Folks leads 16 colleges and 24 schools as well as academic affairs, faculty affairs, libraries, University Information Technology Services, UA Global, and student services. She also holds the rank of professor in the Department of Electrical and Computer Engineering.

Dr. Folks earned a master's degree in business administration from Cornell University after completing both a doctorate and Bachelor of Science degrees in physics from the University of Western Australia.

**Steve Jurczyk**
**Co-Founder, President and CEO**
**Quantum Space, LLC**

Steve Jurczyk is currently the President and CEO of Quantum Space, a space infrastructure, data, and services company aimed at revolutionizing the way satellites are designed, built, and operated.

Mr. Jurczyk was NASA's associate administrator, the agency's "chief operating officer" and highest-ranking civil servant, from May 2018 to May 2021. He also served as acting NASA administrator from January 20 to May 3, 2021.

Before that assignment he had been the associate administrator of the Space Technology Mission Directorate since June 2015. In this position he formulated and executed the agency's space technology programs, focusing on developing and demonstrating transformative technologies for human and robotic exploration of the solar system in partnership with industry and academia.

He previously was director of NASA's Langley Research Center in Hampton, Virginia. Named to this position in May 2014, he headed NASA's first field Center, which plays a critical role in NASA's aeronautics research, exploration and science missions. Jurczyk served as Langley's deputy center director from August 2006 until his appointment as director.

Jurczyk is a graduate of the University of Virginia, from which he received Bachelor of Science and Master of Science degrees in Electrical Engineering in 1984 and 1986. He is an associate fellow of the American Institute of Aeronautics and Astronautics.

**Day 2, Wednesday, September 21**

**Erika Hamden, University of Arizona**
**Assistant Professor, Department of Astronomy, & Assistant Astronomer, Steward Observatory**

Dr. Hamden's research focuses on UV instrumentation, detector technology development, multi-object & IFU spectroscopy, galaxy evolution, and star formation. Dr. Hamden is interested in large scale galactic outflows and inflows, understanding molecular hydrogen in nearby star forming regions, and advancing UV missions of all types. Dr. Hamden has a close relationship with the Advanced Detectors, Systems and Nanoscience Group (389E) Group at JPL. She also has a larger interest in silicon detector technologies. She is the PI of Hyperion, a mission in development designed to observe molecular hydrogen in our galaxy to better understand how stars form. She is also the Deputy PI of Aspera, a NASA Pioneers Mission (PI: Dr. Carlos Vargas), which will observe nearby edge-on galaxies in the extreme UV. Aspera is scheduled to launch in 2025.

Dr. Hamden received a bachelors in Astronomy and Astrophysics from Harvard in 2006. She worked as a chef for a year before beginning grad school at Columbia University. She worked with Prof. David Schiminovich, finishing her PhD in 2014. She moved to Caltech for a postdoc, working with Prof. Chris Martin and was an NSF Astronomy and Astrophysics Postdoctoral Fellow and the R.A. and G.B. Millikan Prize Postdoctoral Fellow in Experimental Physics at the California Institute of Technology. Dr. Hamden was awarded a Nancy Grace Roman Technology Fellowship for her detector work in 2016. She received a PECASE award in 2019 and has received numerous other awards from NASA. She is also the founder and organizer of the PI Launchpad.

**Evening Women of Science Event:**

**Dani DellaGiustina, University of Arizona**
**Lead Image Processing Scientist for NASA's OSIRIS-REx Mission**

Ms. DellaGiustina is the Lead Image Processing Scientist for NASA's OSIRIS-REx Asteroid Sample Return Mission. She holds a B.S. in Physics from the University of Arizona, and an M.S. in Computational Physics from the University of Alaska. She got her start at LPL as an undergraduate in the Arizona Space Grant program working with Professor Dante Lauretta to characterize mineral phases in meteorites.

Daniella continued to work at LPL with Dante Lauretta and Michael Drake, leading a student experiment on the Phase A Discovery OSIRIS Mission until the end of her undergraduate career. In graduate school, she fused remotely-sensed observations of Earth's cryosphere with the numerical modeling techniques to understand the dynamics of the Greenland ice sheet. Daniella returned to the University of Arizona in 2012 as a Research Scientist in the Department of Physics, and transitioned back to LPL in early 2014. In her spare time she is an avid rock-climber and outdoor enthusiast, and serves as a Director for the Climbing Association of Southern Arizona (CASA).

**DAY 3, Thursday, September 22**

**John Adams, University of Arizona**
**Deputy Director, Biosphere 2**

For two decades, John Adams has helped drive the evolution of Biosphere 2 through positions of progressive responsibility and oversight. Starting in 1995, Adams lead all terrestrial experiments inside Biosphere 2. Building on his deep knowledge of the facility and its science, Adams became Biosphere 2's Media Coordinator and Public Spokesperson at Columbia University in 1999, fielding B2 inquiries from around the world, building public understanding of the University's groundbreaking earth systems science research and developing its K-12 education programs (Passport to Learning™). At the same time, Adams assumed leadership for B2's exhibits and public outreach staff. After a year in the private industry biotech sector overseeing R&D as well as aspects of sales, marketing, engineering and design for an innovative water treatment technology, Adams' returned to B2 in 2004, bringing his unique institutional knowledge of the facility to bear as a critical member of the B2 transition team. Adams' experience and vision filled critical roles throughout that period in the positions of Facilities Manager, Health & Safety Supervisor, Public Outreach Coordinator and Biological systems manager, culminating in his being named Assistant Director of Planning and Facilities, a mantle he held for seven years. In 2014, Adams advanced to his current leadership role of Biosphere 2 Deputy Director and Chief Operating Officer. In part, the promotion marked a return to his roots, engaging as a key member of the team that plans and directs all research and related activities inside Biosphere 2 and the surrounding campus.